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The Impact of the COVID-19 Pandemic on Business Expectations*

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Abstract

We document and evaluate how businesses are reacting to the COVID-19 crisis through August 2020. First, on net, firms see the shock (thus far) largely as a demand rather than supply shock. A greater share of firms report significant or severe disruption to sales activity than to supply chains. We compare these measures of disruption to their expected changes in selling prices and find that, even for firms that report supply chain disruption, they expect to lower near-term selling prices on average. We also show that firms are engaging in wage cuts and expect to trim wages further before the end of 2020. These cuts stem from firms that have been disproportionally negatively impacted by the pandemic. Second, firms (like professional forecasters) have responded to the COVID-19 pandemic by lowering their 1-year ahead inflation expectations. These responses stand in stark contrast to that of household inflation expectations (as measured by the University of Michigan or the New York Fed). Indeed, firms' 1-year ahead inflation expectations fell precipitously (to a series low) following the onset of the pandemic, while household measures of inflation expectations jumped markedly. Third, despite the dramatic decline in firms' near-term inflation expectations, their longer-run inflation expectations remain reasonably well-anchored.

JEL Classification Numbers: E31, E32

Keywords: Business Expectations, COVID-19, Demand Shock, Inflation, Pandemic, Supply Shock

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"Now we see a big shock to demand, and we see core inflation dropping to 1 percent. And I do think for quite some time we're going to be struggling against disinflationary pressures rather than against inflationary pressures."

— Chair Powell. Post–FOMC Press Conference. July 29, 2020[1]

1. Introduction

By mid-March, it was clear that a novel coronavirus (COVID-19) had reached the shores of the United States. State-mandated lockdowns temporarily shuttered many nonessential businesses, the U.S. government had instituted travel bans to many countries, and, among businesses still open, many saw depressed levels of sales activity.[2] Indeed, economic activity as measured by real GDP contracted by 5 percent in the first quarter and, according to the initial estimate from the Bureau of Economic Analysis, fell by an astounding 33 percent in the second quarter, marking the COVID-19 crisis as the swiftest and most severe economic shock the U.S. has experienced in modern times.

Amid supply chain disruption and alongside widespread shutdowns, production has been crimped. However, demand appears to have taken a bigger hit, as those emergency shutdowns have also left households shuttered in their homes, consumer spending has fallen dramatically, and business investment spending has dried up. Given the backdrop of low inflation since the onset of the Great Recession, the behavior of inflation expectations is of particular interest. In a recent speech, Fed Governor, Lael Brainard, noted, "With underlying inflation running below 2 percent for many years and COVID contributing to a further decline, it is important that monetary policy support inflation expectations that are consistent with inflation centered on 2 percent over time."[3]

[1] https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20200729.pdf

[2] Based on a new big data index developed by Brave, Butters and Kelley (2019), Li and Sheng (2020) identify COVID-induced recession beginning in March 2020. Indeed, high-frequency data on small firm closings and activity from HomeBase (https://joinhomebase.com/blog/real-time-covid-19-data/), as well as high-frequency data from Opportunity Insights (https://tracktherecovery.org/) described in Chetty et al (2020) point to a sharp contraction in activity beginning in mid-March.

[3] Lael Brainard. "Navigating Monetary Policy through the Fog of COVID." July 14, 2020. Remarks given via webcast to the NABE. https://www.federalreserve.gov/newsevents/speech/brainard20200714a.htm

In this paper, we utilize the Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey* to uncover how firms are perceiving and reacting to the COVID-19 pandemic. Our analysis focuses, importantly, on how this shock has affected their inflation expectations going forward. First, we examine whether firms, en masse, see the pandemic as a supply or demand shock. Our results suggest that, while both elements of a supply shock and demand shock are present, firms, on net, view the COVID-19 pandemic as a demand shock. These findings are based on a series of quarterly and special questions that assess the level of disruption that COVID-19 has inflicted on sales activity, business operations, and supply chains; quantitative assessments of firms' sales levels relative to 'normal'; firms' expected price changes over the near-term; firms' experienced and expected wage changes; and changes in the inflation expectations from before to during the pandemic.

The literature disentangling firms' perceptions of the COVID-19 pandemic is nascent, mixed, and can be loosely grouped into two strains. The first strain—which argues that demand shocks dominate—takes a broad approach to uncovering the perceptions of firms regarding the nature of the pandemic, eliciting direct evidence of changes in firms' behavior, perceptions, and expectations. Hassan et al. (2020) analyze transcripts of quarterly earnings calls held by public firms across the globe and find concerns over a negative demand shock are nearly twice as prevalent as mentions of supply chain disruption. In a survey of small firms, Bartik et al (2020) find respondents cited reductions in demand to a much larger degree than supply chain issues as reasons for temporary closures. And, Meyer, McCord, and Waddell (2020) find that firms' most pressing concerns are overwhelmingly centered on flagging demand and declining sales revenue, with the 'health of the economy' coming in a distant second and 'supply chain concerns' registered as a much lower issue.

The other strain of literature relies largely on inference rather than direct responses from business decision makers to conclude the pandemic as a supply shock. Brinca et al (2020) use structural econometric methods to decompose changes in hours working into supply and demand shock contributions, finding that the supply shock contribution outweighs the demand shock contribution. Candia, Coibion, and Gorodnichenko (2020) suggest that *some* firms (and most households)

see the pandemic as a supply shock, coming to that view through the lens of firms' *aggregate* inflation expectations. Related research by Dietrich et al. (2020), while focused on households, reach the same conclusion through survey research that elicits expectations for the COVID-19 pandemic's impact on *aggregate* inflation.

Importantly, our results, like Hassan et al (2020) take a more holistic and direct approach to uncovering firms' perceptions of the pandemic.

Second, consistent with a shortfall in demand, we document that the inflation expectations of businesses (like those of professional forecasters) have fallen precipitously. In fact, both firms' perceptions of current inflation and their year-ahead inflation expectations fell to an all-time low (going back to October 2011) in April, as the pandemic grew in severity. We also document that household survey measures of inflation expectations – specifically the University of Michigan's Survey of Consumers and the New York Fed's Survey of Consumer Expectations both registered sharp increases in expectations relative to the pre-COVID period. We offer evidence that suggests households are viewing the COVID pandemic as a supply shock (or at least a relative price shock to grocery store items).

Third, despite the magnitude of the decline in their near-term inflation perceptions and expectations, firms' longer-run expectations appear to be relatively stable. There appears to be little to no relationship between a firm's change in 1-year ahead expectations and the change in its longer-run inflation expectations from the pre-COVID period to during the crisis. Moreover, while distribution of firms' 1-year ahead inflation expectations has shifted markedly lower, this downward shift is not evident in firms' longer-run (5-10 year ahead) inflation expectations, suggesting that firms' expectations are well-anchored.

The rest of the paper proceeds as follows. Section 2 briefly discusses the dataset. Section 3 analyzes how the COVID-19 shock affects firms' sales levels, business operations, expected price changes and wage changes. Section 4 and Section 5 focus on firms' short-run and long-run inflation expectations during the crisis. Section 6 concludes.

2. Data

We use the microdata and special question results from the Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey* (BIE). The BIE is a monthly survey of firms in the 6th Federal Reserve District (which covers most of the Southeastern United States) that has been fielded continuously since October 2011. At its core, the BIE survey elicits firms' probabilistic inflation expectations using a method popularized by Manski (2004). As shown in Meyer, Parker and Sheng (2020), this probabilistic measure of the inflation expectations of firms covaries strongly with the inflation expectations of professional forecasters, yields an inflation perception that mirrors current inflation trends, and is highly correlated with a national measure of probabilistic inflation expectations from the *Survey of Business Uncertainty* (SBU).[4]

In addition to its core focus on inflation expectations, the BIE survey elicits firms' qualitative judgments and quantitative estimates regarding firms' sales levels, margins, and other factors thought to drive businesses' pricing decisions. The questionnaire also contains space for researchers to ask special questions that are policy-relevant, topical, or related to broader academic research. In this paper, we make use of firms' quantitative assessments of their sales "gap" – current sales levels relative to normal – as well as a series of special questions designed to uncover firms' assessments of disruption incurred due to the novel coronavirus, their expectations for their own price changes, and what they anticipate for the path of the virus. A detailed discussion of the data, the specific form of the questions we pose to respondents, and survey descriptions can be found in the online appendix.[5]

3. How do firms view the COVID-19 shock?

While early news reports of empty grocery shelves have made it clear that the pandemic is crimping some supply chains, at the same time, widespread efforts to control the spread of the virus

[4]See Altig et al (2020a) for an overview of the SBU survey and its properties. At the SBU's inception, the survey elicited 1-year ahead unit-cost (inflation) expectations from firms using a question design different from the BIE in the choice to allow respondents to input both the support points and associated probabilities, rather than assigning probabilities to fixed bins. Meyer, Parker and Sheng (2020) evaluate the aggregate responses of the two surveys, finding that the two different methods yielded very similar expectations and uncertainty estimates.

[5]Further information can be found here: https://www.frbatlanta.org/research/inflationproject/bie

caused schools, restaurants, and hotels to temporarily close, leading many farmers and food producers to destroy unused food products amid the free-fall in demand.[6]

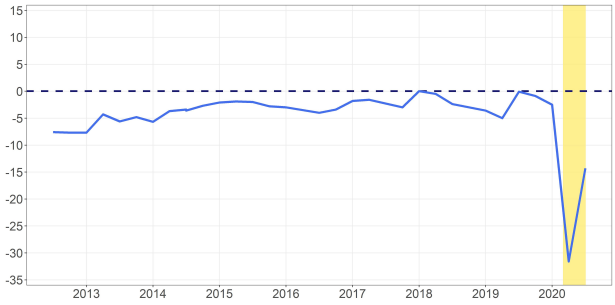
Cochrane (2020), Kharas and Triggs (2020), and others all point out that the COVID pandemic is unlike a standard recessionary (aggregate demand) shock or a typical inflationary supply shock (oil prices shocks). This "health shock" has characteristics of both. Guerrieri, Lorenzoni, Straub, and Werning (2020) present a model that suggests severe negative supply shocks (like the COVID-19 shock) can lead to a shortfall in aggregate demand that outweighs the effects of the initial supply shock. On the other hand, Abo-Zaid and Sheng (2020) present a dynamic general equilibrium model with a health shock, finding that, while health shocks have significant supply-side effects on economic activity, the demand-side effects are considerably bigger, particularly for shorter horizons and more rigid prices. In relation to both papers, the question is whether firms see the COVID shock, on net, as more of a supply shock (leading them to anticipate higher inflation in the future) or a demand shock (lowering their expectations for future inflation and the prices they set).

The overwhelmingly negative nature of the shock to firms' sales levels is evident in Figure 1. Recovering from the 2007–2009 financial crisis and recession, firms' quantitative sales gap measure had slowly been moving toward zero (or "normal" sales levels) alongside solid gains in output growth and previously strong job gains. However, that all changed in April. Firms surveyed from April 6 to 10, showed an extraordinarily large decline in sales levels relative to normal – from 2.5 percent below normal in the first quarter to 32 percent below normal in April (see the charts). The decline in sales had an impact on firms of all sizes, but smaller firms reported a much larger hit to sales than did firms with more than 100 employees as evidenced in Figure 2. Firms' assessment of sales gaps rebounded somewhat in July, but still remains solidly negative. These results are very similar to the pattern we see in high frequency and macroeconomic data we have in hand thus far into the pandemic.[7] These patterns are also consistent with other business survey findings that elicit the anticipated impact the coronavirus will have in 2020 (see Altig et al (2020b) and Bloom, Fletcher, and Yeh (2020)). Of course, a sharp widening in the sales gap could be due to either a

[6] https://www.nytimes.com/2020/04/11/business/coronavirus-destroying-food.html

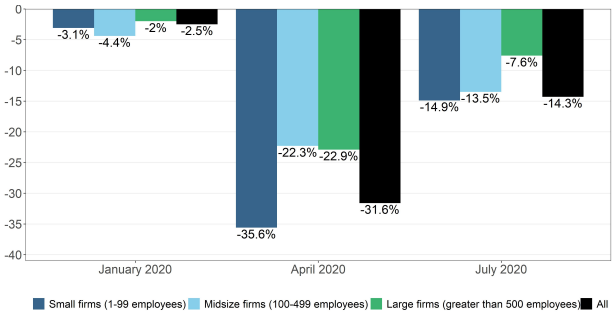
[7] See Chetty et al (2020) or visit tracktherecovery.org; Homebase data at https://joinhomebase.com/blog/an-update-on-small-business-as-covid-19-cases-rise/; Cajner et al (2020); Barrero, Bloom, and Davis (2020); and Bartik et al (2020).

Figure 1: Firms' percentage below "normal" sales levels



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*.

Figure 2: Firms' mean quantitative sales gap by firm size



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*.

supply shock or a demand shock.

To disentangle whether firms see COVID-19 as mainly a supply or demand shock, we asked a series of special questions in April and May 2020. First, we asked firms to assess the level of disruption the pandemic has to their business operations, supply chains, sales activity, on a scale of "no disruption" to "severe disruption."[8] As shown in Figure 3, more than half the firms surveyed indicated severe disruption to their sales activity and another 18 percent indicated "significant" disruption to sales activity. This compares to just over 10 percent of firms that indicated severe disruption to supply chains. The median respondent indicated moderate disruption to supply chains stemming from the pandemic.

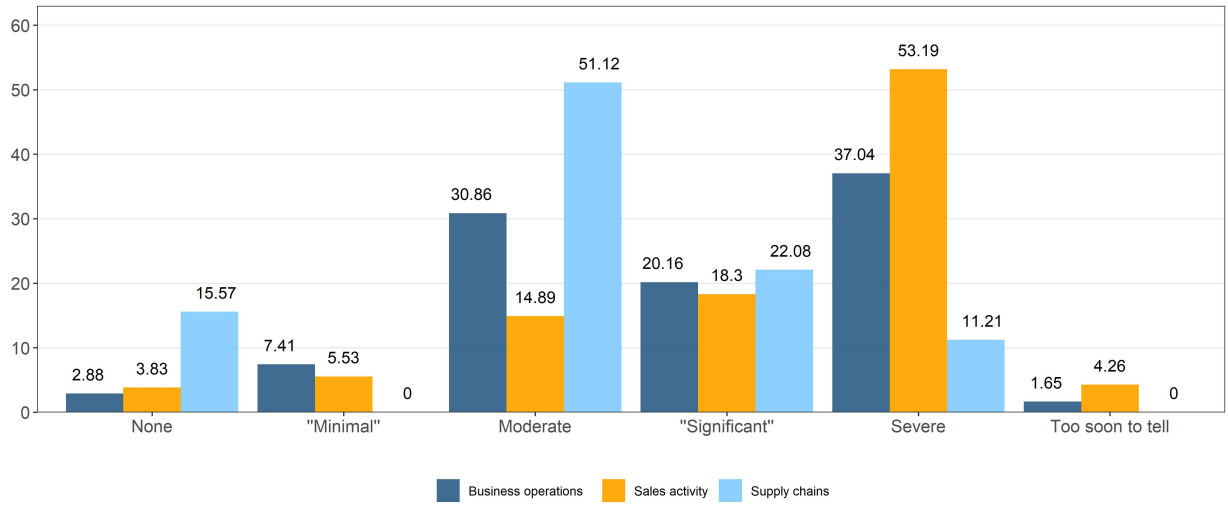
Table 1 relates a firm's response to their level of disruption across business operations, sales activity, and supply chains. The mean sales gap across these categories aligns most closely with disruption to sales activity. Indeed, even firms that indicated no supply disruption had a sharply negative sales gap. Among those firms experiencing severe disruption, sales levels fell to roughly one half relative to normal sales conditions. Similar to Barrero et al (2020), these results suggest that the disruption associated with the outbreak has not hit all firms equally. There is evidence of dispersion (reallocation) across firms, as a small share of firms that indicated they are experiencing low levels of disruption are seeing stronger-than-usual sales levels.[9] Our findings also related

[8] In April 2020, we asked about disruption to sales activity and business operations. In May 2020, we asked about disruption to sales activity, supply chains, and staffing levels.

[9] Among the relatively small share of firms that indicated a positive sales gap, were disproportionately in industries that correspond to the strong shifts in demand that we have seen in Census and high-frequency data (grocers,

favorably to a national survey of CFOs, which in June 2020, elicited firms' most pressing concerns over the previous 3 months in an open text format, finding 6 times more frequent mentions of concerns over flagging demand than over supply chain concerns.[10] In April 2020, we followed

Figure 3: Level of disruption by activity type



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, April and May 2020.
Notes: There were 243 observations to the business operations question, 235 to the sales activity question, and 212 to the supply chains question. The supply chains questions did not contain responses corresponding to "Minimal" or "Too soon to tell". The correlation between responses to operations and sales activity: 0.54, and the correlation between supply chains and sales activity: 0.22. The specific questions asked are given by Appendix A Figures 21 and 22.

up the disruption questions with a question regarding firms' expectations for their own selling prices over the next 6 months. The intention was to evaluate firms' anticipated price changes by their disruption to sales activity. As Table 2(A) indicates, the majority of firms anticipated holding prices constant over the next 6 months, though nearly twice as many firms anticipated decreasing their selling price than increasing it.[11] For those firms expecting to change their price, the magnitudes are sizeable. The median expectation among those anticipating to decrease prices over the next 6 months is -13.5 percent. For those anticipating to increase, the median expectation

construction firms, transportation & warehousing, non-durable goods manufacturers, etc.).

[10]For details: https://www.richmondfed.org/research/national_economy/cfo_survey/research_and_commentary. When the topic of a survey question is wide-ranging, the open-text approach (evaluated using text analysis) tends to be less biasing than having firms choose from a set of response options.

[11]Finding a majority of firms not changing prices over the next 6 months is not surprising in light of the extensive literature on price stickiness.

Table 1: Mean quantitative sales gap by level of disruption

	Operations	Sales	Supply
None	3%	7%	−16%
"Minimal"	−10%	4%	−−
Moderate	−20%	−7%	−18%
"Significant"	−19%	−15%	−43%
Severe	−51%	−52%	−55%

Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, March and April, 2020.
Notes: Responses from the financial industry are excluded. There are 206 observations from "operations", 193 from "sales activity", and 166 for "supply". The correlation between quantitative sales gap and sales distribution, disruption to operations, and supply chain disruption is −0.64, -0.48, and -0.35, respectively. The missing value in the Supply column is due to that month's survey asking one fewer question than the operations and sales questions. The specific questions asked are a combination of Appendix A Figures 18, 19, and 20, 21 and 22.

is a 5 percent increase. While, as with sales gaps, there is quite a bit of dispersion in expectations, the thrust of price pressures has a definite downside tilt. Firms, on average, anticipate lowering prices by 2.2 percent over the 6-month period from April to October; see Table 2(B).

Table 2(C) also offers further evidence that firms see the pandemic as a demand shock. The right-hand table shows the mean expected price change by level of sales disruption. Firms indicating no negative disruption to sales activity anticipate increasing selling prices by 4.6 percent on average (nearly every firm expecting to increase prices indicated "no" negative sales disruption in April), while those experiencing severe disruption to sales activity anticipate lowering prices by 3.2 percent, on average.

Panels (A) and (B) in Table 3 corroborate the notion that firms see COVID-19 largely as a demand shock. These tables compare mean expected price changes by variety degrees of sales gap and the severity of supply chain disruption. Interestingly, and counter to what standard theory would suggest about supply shocks, firms that indicated they were experiencing supply chain disruption anticipated lowering prices over the next 6 months, rather than increasing them. For firms experiencing severe supply chain disruption, the mean expected price change was a striking -15.5 percent. And, here a further examination of the microdata indicates that all of the firms experiencing severe supply chain disruption also experienced significant or severe sales disruption as well. The fact that the firms that were doubly impacted by supply chain and sales disruption

Table 2: Firms' response to expected price change questions

Panel A: Share of firms expecting a price change	
Change in price	Share of firms
Increase	15.0%
Decrease	26.0%
Remain the same	59.0%
Panel B: Expected price change over the next six months	
Statistic	Expected price change
Mean	−2.2%
Median	0.0%
P10	−20.0%
P90	5.0%
Panel C: Expected price change by level of disruption to sales activity	
Level of sales disruption	Expected price change
None	4.6%
"Minimal"	−2.5%
Moderate	−0.8%
"Significant"	−1.3%
Severe	−3.2%

Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey* April 2020.
Note: There were 239 observations for the responses in Panels (A)–(C). The specific questions asked are located in Appendix A Figures 21, 23 and 24

indicated lowering prices, on average, suggests that COVID-19 has been much more of a demand than a supply shock.

In addition to firms' expected price changes, we also offer evidence from firms' wage-setting behavior that corroborates the view that firms see COVID-19, on net, as a demand shock. In August 2020, we asked firms in the BIE to, first, characterize their workforce between "high-skilled" and "low-skilled" labor and followed up with questions eliciting what share of their (high-and-low skilled) workforce as seen increases, decreases, or no change in their wages since the onset of the COVID-19 pandemic. That was followed by the same question only in expectation, with a timeframe from the present until the end of 2020.[12]

Figure 4 shows that firms cut nominal wages for 10 percent of continuing employees, a result

[12]See Appendix A for the specific wording to these and all survey questions used in this paper.

Table 3: Firms' expected price change by quantitative sales gap and level of supply chain disruption

Panel A: Expected price change by mean quantitative sales gap	
Sales gap	Expected price change
$\geq 0\%$	-0.5%
[-25%, 0%)	-2.5%
$< 25\%$	-4.7%
Panel B: Expected price change by level of disruption to supply chains	
Level of supply chain disruption	Expected price change
None	7.3%
"Some"	-2.1%
"Significant"	-2.0%
Severe	-15.5%

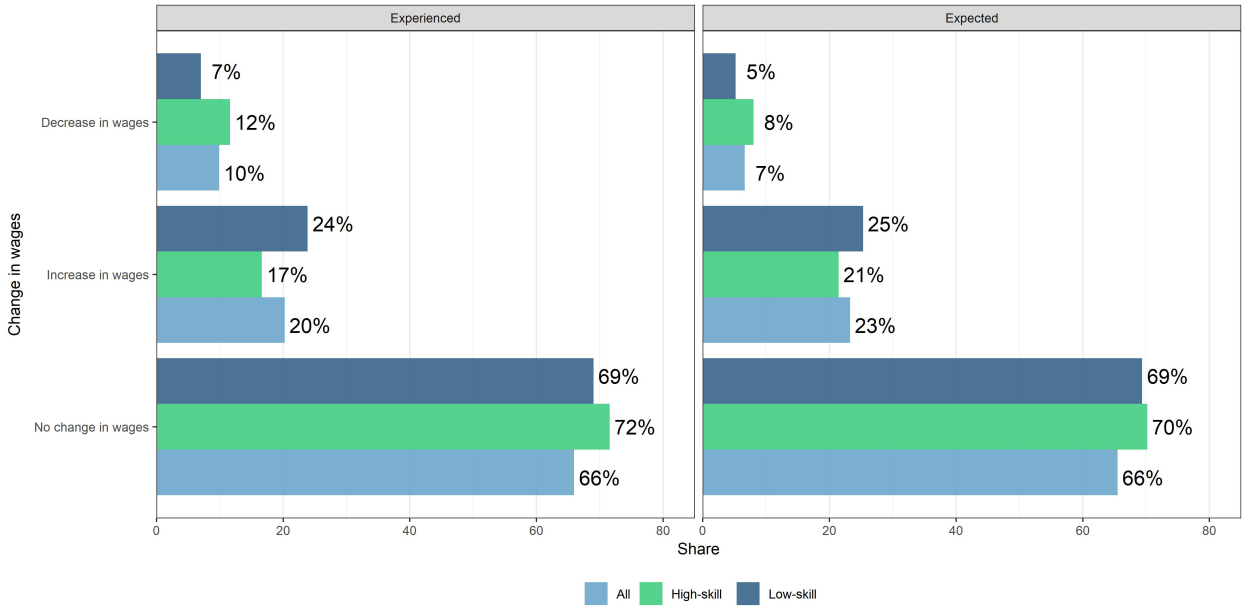
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey* April 2020.
Note: There were 239 observations for the responses in Panels (A) and 189 for the responses in panel (B). Of the firms experiencing severe supply chain disruption in Panel (B), all of them noted significant or severe sales disruption as well. The specific questions asked are given in Appendix A Figures 18, 19, 20, 22 and 24.

that is nearly identical to what Cajner et al (2020) find using administrative payrolls data. The apparent lessening of downward nominal rigidity during the COVID-19 pandemic is quite unusual. As Cajner et al note in their paper, the prevalence of these wage cuts are roughly twice what continuing employees experienced during the entirety of the Great Recession.[13] Interestingly and perhaps somewhat worrisome, our results suggest that firms anticipate further negative wage adjustments by the end of the year.

Figure 5 shed some light on the nature of the COVID-19 shock. Firms hit the hardest by the shock are those that are disproportionately engaging in wage cuts. This holds both for the severity of the sales disruption and for the severity of the shortfall in firm's quantitative sales gap. These responses on the part of business decision makers to cut wages given dramatic declines in sales activity and amid severe disruption due to the pandemic further bolster the claim that demand

[13]This phenomenon is also unusual in the history of the BIE. While not directly comparable to our current results, in September 2018 we elicited firms' year-ahead probabilistic wage growth expectations. Only one respondent at the time indicated the potential for negative wage growth in a "lowest-case" expectation. See the BIE's special question archive for 2018 (https://www.frbatlanta.org/research/inflationproject/bie/special-questions.aspx?pub_year=2018) for more details.

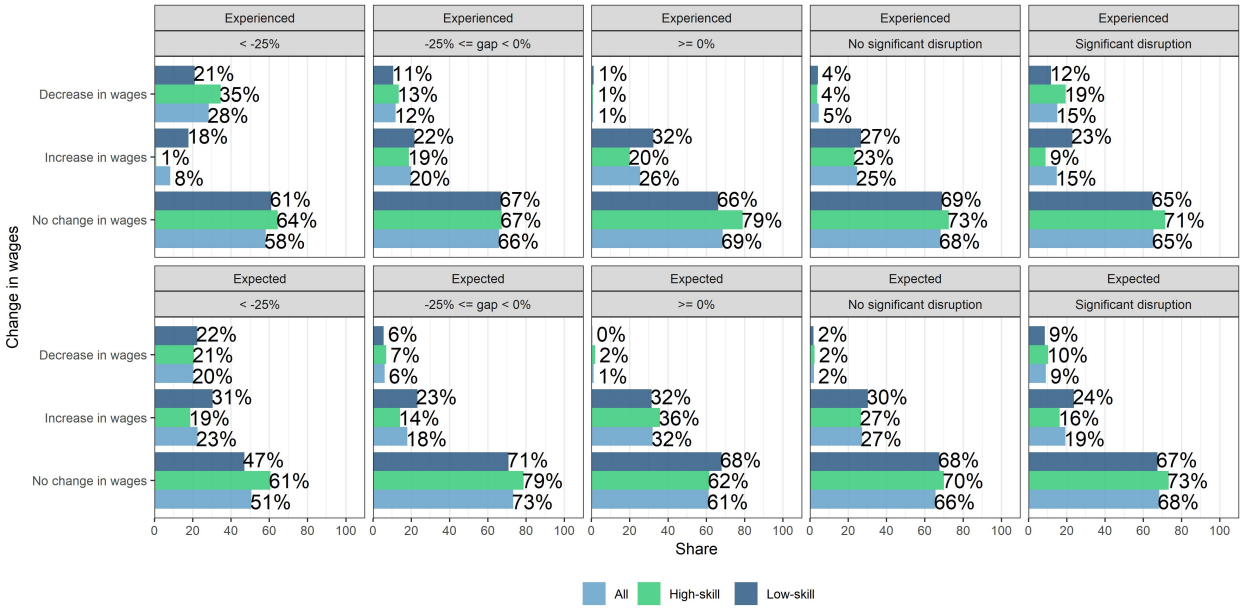
Figure 4: Firms' Experienced and Expected Wage Changes



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, August 2020.
Notes: Respondents were only asked about their wage changes for a skill level if they indicated the presence of a low-skill or high-skill workforce. There were 160 responses for the low-skill experienced and expected wage change, 175 for the high-skill experienced wage change, and 176 for the high-skill expected wage change. The specific questions asked are given in Appendix A Figures 26, 27, 28 and 29.

shocks are overpowering the supply shocks. If supply shocks were dominating, standard theory would suggest upward pressure on wages. These results stand in contrast to the findings by Brinca et al (2020) that use a structural Bayesian VAR to decompose changes in hours worked by sector into supply and demand shock contributions and conclude that the supply shocks dominate. Our results indicate that firms view the enormous impact that the pandemic is having on economic activity as, on net, a demand shock. Firms anticipate, on average, lowering prices in the near future and much of that downward price pressure is stemming from firms disproportionately impacted by the virus (even among those that noted significant or severe supply chain disruption). These findings are supported by the material (and unusually high) share of negative nominal wage adjustments that we have seen so far during this crisis and those that firms' anticipate over the remainder of the year. Moreover, other business surveys, such as in Bartik et al (2020) tell a consistent story. In fact, they note, "Respondents that had temporarily closed [early

Figure 5: Firms' experienced and expected wage changes by quantitative sales gap and level of sales disruption



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey* July and August 2020.
Notes: The low-skill expected and experienced values are based on were 149 responses, 164 and 165 responses to the high skill questions, and 332 responses for the all sales disruption category. Additionally, the sales gap category had 152 responses for the low-skill expected and experienced values, 167 and 168 responses to the high skill questions, and 338 responses for the all category. The specific questions are given by Appendix A Figures 18, 19, 20, 26, 27, 28 and 29.

in the pandemic] largely pointed to reductions in demand and employee health concerns as the reasons for closure, with disruptions in the supply chain being less of a factor."

4. COVID-19's Impact on Inflation Expectations

Alongside the freefall in demand, COVID-19 has also significant impact on inflation expectations. Specifically, the pandemic has lowered businesses' and professional forecasters' inflation expectations over the year-ahead, while, simultaneously causing household inflation expectations to increase markedly. In this section, we provide evidence that firms and professional forecasters view COVID-19 in fundamentally different ways, with firms and forecasters responding to the shock by ratcheting down their expectations in sharp contrast with the expectations held by households.

Meyer, Parker and Sheng (2020) establish that both short and long-run inflation expectations

of firms are highly correlated with professional forecasters' expectations.[14] In particular, firms' 1-year ahead inflation expectations from the BIE carry a correlation coefficient of 0.87 with professional forecasters' 1-year ahead GDP deflator expectations from the Philadelphia Fed's Survey of Professional Forecasters (SPF) over a sample period from 2011q4–2020q1. Moreover, firms' aggregate perceptions of inflation over the past year are highly correlated with observed official inflation statistics.[15]

While this paper is more about understanding how firms are responding to the COVID-19 shock, we acknowledge that many readers will view that previous paragraph as incongruent with the widely cited survey literature from Coibion, Gorodnichenko, and co-authors (2015, 2018, 2020) on firms' aggregate inflation expectations. Meyer, Parker and Sheng (2020) build on the survey work by Bryan et al (2015) to show: question wording matters a great deal to respondents' interpretation of inflation; in this low inflation environment the U.S. has experienced since 2011 firms may be rationally ignorant of "prices in general/overall in the economy"; and that eliciting firms unit cost expectations yields a time-series inflation expectations measure that is highly correlated with professional forecasts, uncorrelated with household forecasts, and is far superior in terms of forecasting ability than current household measures of inflation expectations. We view this pandemic as furthering the distinction between business and household inflation expectations.

Consistent with firms' collective judgment that COVID-19 is more of a demand than supply shock, they have ratcheted down their inflation expectations markedly. Businesses' probabilistic 1-year ahead inflation expectations fell to a series low of 1.4 percent in April 2020. Figure 6 shows the distribution of respondents' expected values and the clear downshift in expectations is evident when starting in April 2020.[16] Prior to April, the majority of firms' expectations were centered on 2 percent and there was very little mass in the tails. We can also see this downshift in the mean probabilities assigned to each bin. After the onset of the pandemic, the mean probability assigned

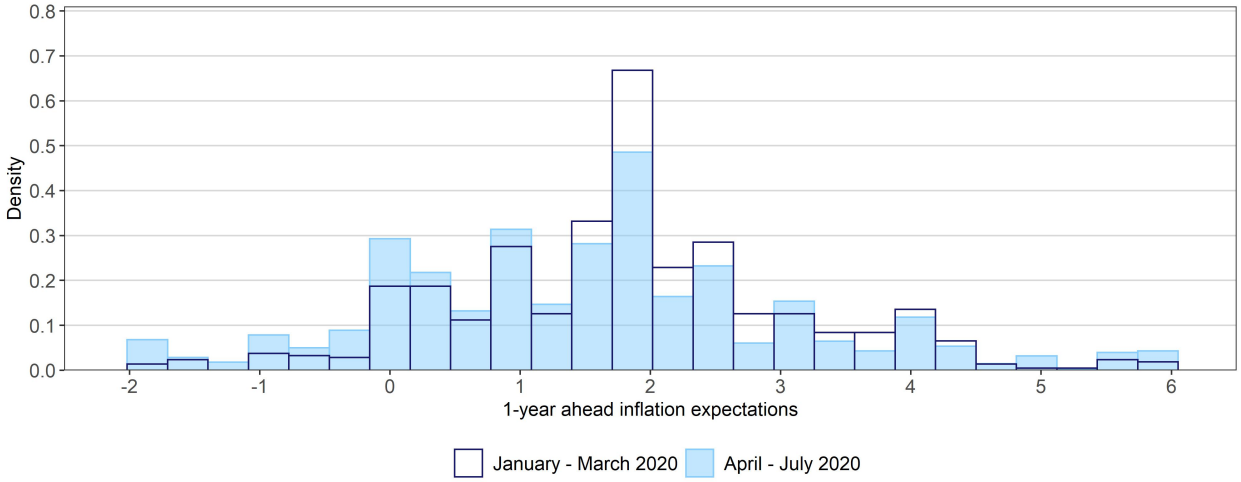
[14]The BIE survey elicits firms' probabilistic unit cost (inflation) expectations. Meyer, Parker and Sheng (2020) discuss the logic behind eliciting unit costs instead of "prices in general/overall in the economy" in detail.

[15]See Appendix B, Figure 30 and 31.

[16]Many view the beginning of the COVID pandemic as occurring on March 13, 2020 and corresponding with shelter-in-place orders happening across the country. The March BIE was in the field from March 2-6, prior to this period. Moreover, a special question posed to the panel in March asked if the recent coronavirus outbreak had an effect on a number of aspects of business activity. The results indicated that, outside of a few firms, the majority of the business community had yet to be impacted.

to the lowest bin (corresponding to negative cost growth) nearly doubled – from 6 percent to 11 percent.

Figure 6: Distribution of firms' short-run inflation expectations from January to July 2020

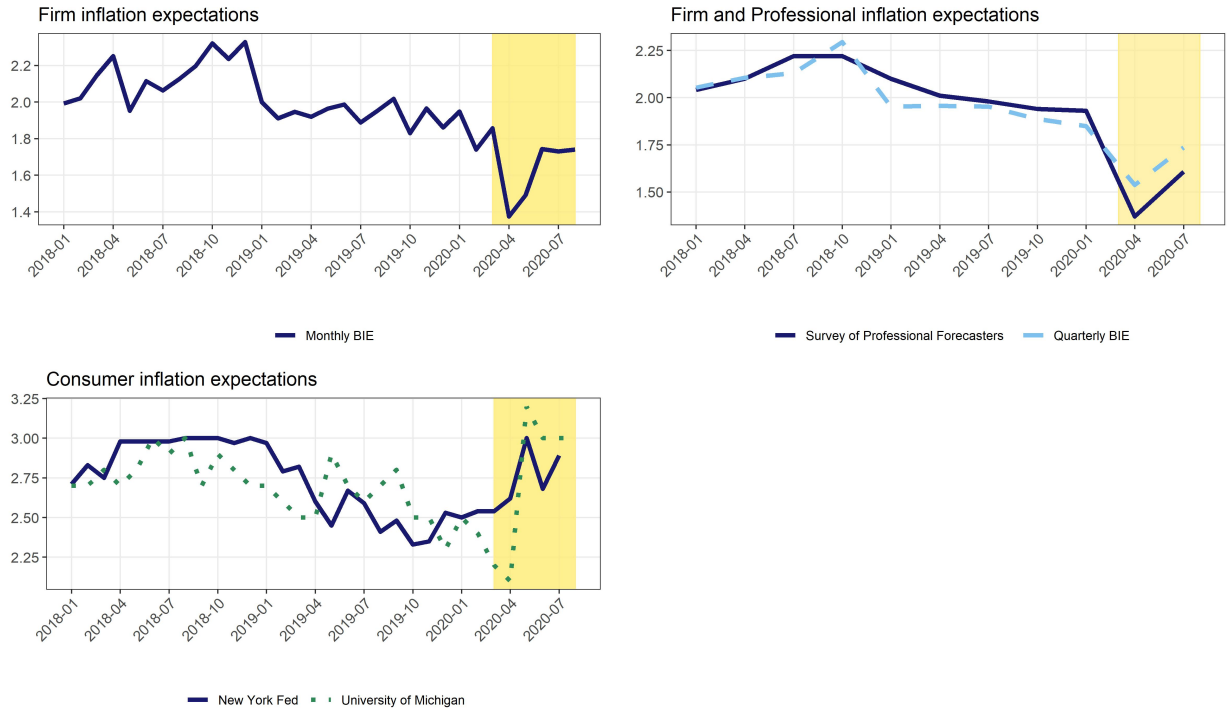


Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey* January–July 2020.
Notes: There were 690 and 903 responses in the pre-COVID and COVID time periods, respectively. The specific question is given by Appendix A Figure 16.

Figure 7 compares 1-year ahead inflation expectations across businesses (from the BIE survey), professional forecasters (SPF survey), and households (from the University of Michigan and from the New York Fed's *Survey of Consumer Expectations* (SCE).[17] The yellow shaded area corresponds with the COVID-19 pandemic. The stark contrast in responses between firms and professionals (sharply lowering expectations) and households (sharply increasing expectations) is clear. It is worth noting that all three of these groups held higher inflation expectations in 2018, a period marked by escalating tension over global trade, increased tariffs, and higher costs of production. Figure 8 plots 1-year ahead uncertainty measures from these three groups, and, again, the difference between the reaction from businesses and professionals to that of households is clear. By May 2020, household 1-year ahead inflation uncertainty in the SCE had jumped up to a series high (the series began in mid-2013). On the other hand, inflation uncertainty measures of firms and professional forecasters ticked up, but remained below their respective levels in 2018-

[17]For background on the SCE, see Armantier et al (2016)

Figure 7: Inflation expectations of consumers, firms, and professionals

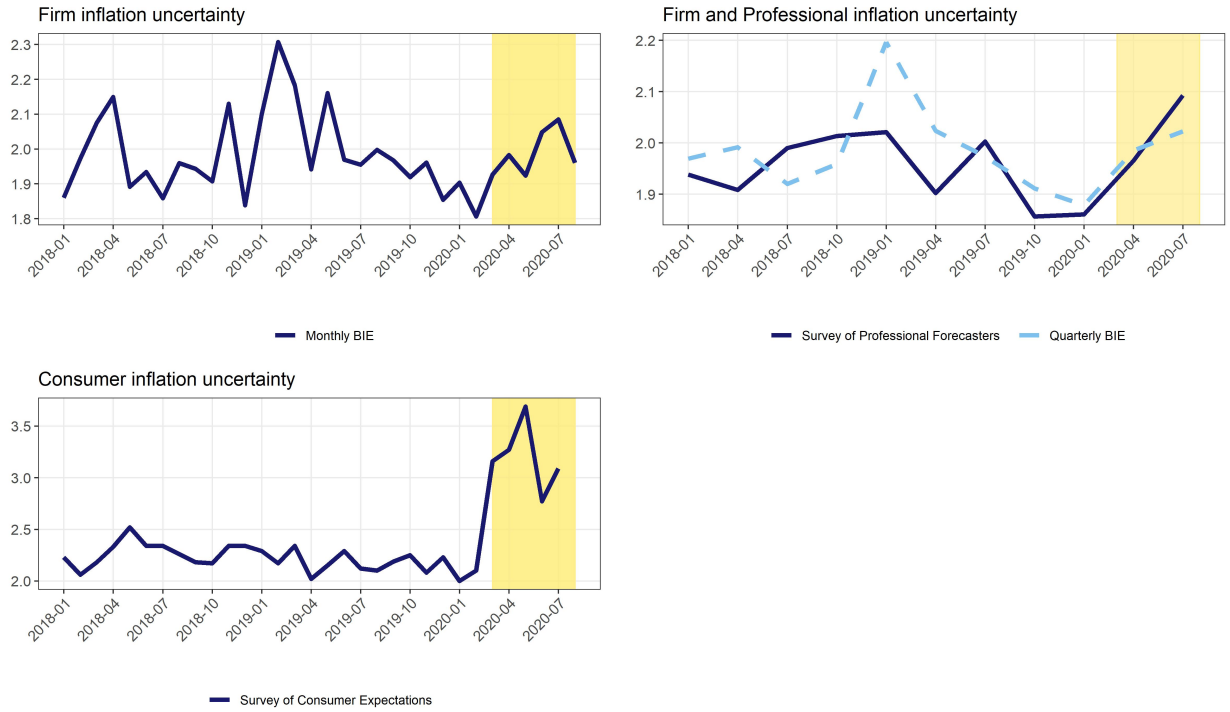


Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, Federal Reserve Bank of New York's *Survey of Consumer Expectations*, Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters*, and the University of Michigan's *Survey of Consumers*.
Notes: The yellow shaded regions begin in March 2020 and signal the onset of the COVID-19 pandemic in the U.S.

19. Firms, in particular, do not appear to be overly uncertain about the likely direction over the coming year. Consistent with lower demand, on net, firms expect inflation to slow. These results do raise the question as to why well-known measures of household inflation expectations have risen sharply in the wake of the COVID-19 pandemic. Here, we highlight that the recent household survey literature around the pandemic's impact on inflation expectations finds mixed results. A high-frequency consumer survey conducted by the Cleveland Fed designed to understand how consumers are reacting to COVID-19, shows that consumers anticipate inflation to increase by roughly 7 percentage points over the next year as a result of the COVID-19 shock.[18] Following a probabilistic approach used by the BIE and in the NY Fed's SCE, Coibion et al (2020) find house-

[18] https://www.clevelandfed.org/en/our-research/indicators-and-data/consumers-and-covid-19.aspx

Figure 8: Inflation uncertainty of consumers, firms, and professionals



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, Federal Reserve Bank of New York's *Survey of Consumer Expectations* and Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters*.
Notes: Uncertainty for the BIE is measured as the mean of the variance of firm inflation expectations, while it is measured as the dispersion between the forecasts for the SPF. Additionally, the SPF series is re-scaled to the level of the quarterly BIE. The yellow shaded regions begin in March 2020 and signal the onset of the COVID-19 pandemic in the U.S.

holds under lockdown actually lowered their inflation expectations moderately.[19] And, Binder (2020) finds household inflation expectations vary by their level of concern regarding the effect of coronavirus on the U.S. economy, with those concerned tending to have much higher inflation expectations.

Consistent with both the notion forwarded in Coibion et al (2020), households may be reacting to spiking grocery store prices. Indeed, the entire upper tail (5 percent by expenditure weight) of the Consumer Price Index price-change distribution (and most of the items that have posted price

[19]They note, "asking specifically about inflation, because asking about prices might induce individuals to think about specific items whose prices they recall rather than about overall inflation."

increases since February 2020) is dominated by these salient consumer goods.[20] And, consistent with Binder (2020), it may be the case that those most concerned by the coronavirus are those most vulnerable to spikes in food prices. Among respondents to the University of Michigan's survey, the sharpest increase in inflation expectations has come from those individuals in the lower tercile of the income distribution.

While it is not entirely clear what is driving common measures of household inflation expectations higher,[21] it is apparent that firms, like professionals, have lowered their year-ahead inflation expectations consistent with a demand shock. We turn next to firms' longer-run (5-10 year ahead) inflation expectations.

5. Long-run Inflation Expectations Appear Anchored for Now

The pandemic has led firms, en masse, to lower their near-term inflation expectations in a manner consistent with a demand shock. However, as shown in Figure 9 firms' longer-run inflation expectations are little changed. On average, firms' longer-run expectations ticked down by 0.1 percentage points from March 2020 to June 2020. There is little evidence of a large shift in the cross-sectional distribution during these early months of the pandemic. Perhaps more importantly, firms that lowered their inflation expectations between March 2020 and June 2020 do not appear to have ratcheted their longer-run expectations down in concert. Exploiting the panel structure of the BIE, Figure 10 reveals no meaningful relationship over the pandemic period between a firm's change in their short-run expectations and the change in their longer-run expectations. In the parlance of Fedspeak, businesses' inflation expectations remain well-anchored.

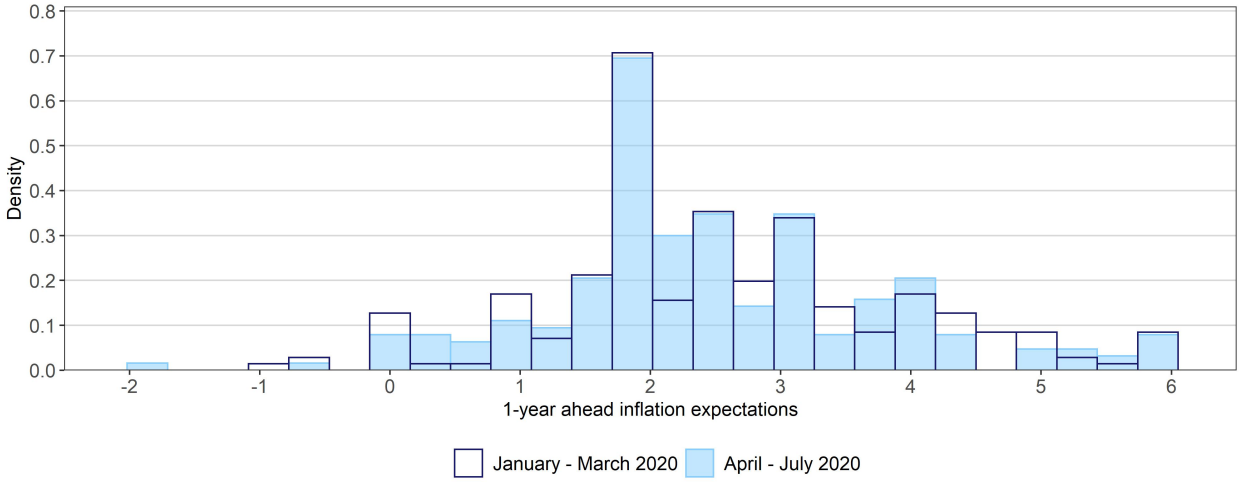
6. Conclusion and Short Discussion

Since mid-March 2020, the coronavirus pandemic has had a profound impact on the U.S. as efforts to stem the spread of the virus led to shutdowns of large swaths of the economy. Business operations, sales activity, and (to a lesser extent) supply chains have all been disrupted. Our results

[20] See Appendix D, Figure 35.

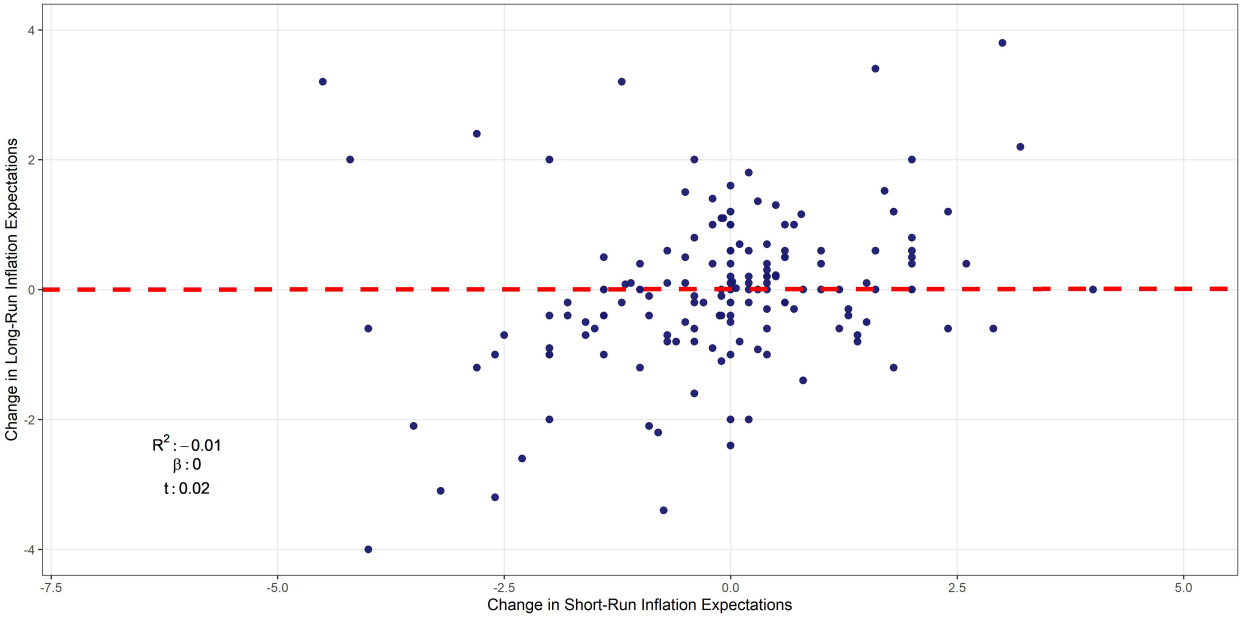
[21] Kamdar (2019) finds that sentiment is a key driver of household macro expectations and many households equate "bad times" with "high inflation."

Figure 9: Distribution of firms' long-run inflation expectations from January to July 2020



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey* January–July 2020.
Notes: There were 228 and 204 responses in the pre-COVID and COVID time periods, respectively. The specific question is given by Appendix A Figure 17

Figure 10: Changes in long-run and short-run inflation expectations from May to June 2020.



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, May and June 2020.
Notes: There were 171 respondents who completed both the May and June 2020 surveys. The specific questions asked are given by Appendix A Figures 16 and 17.

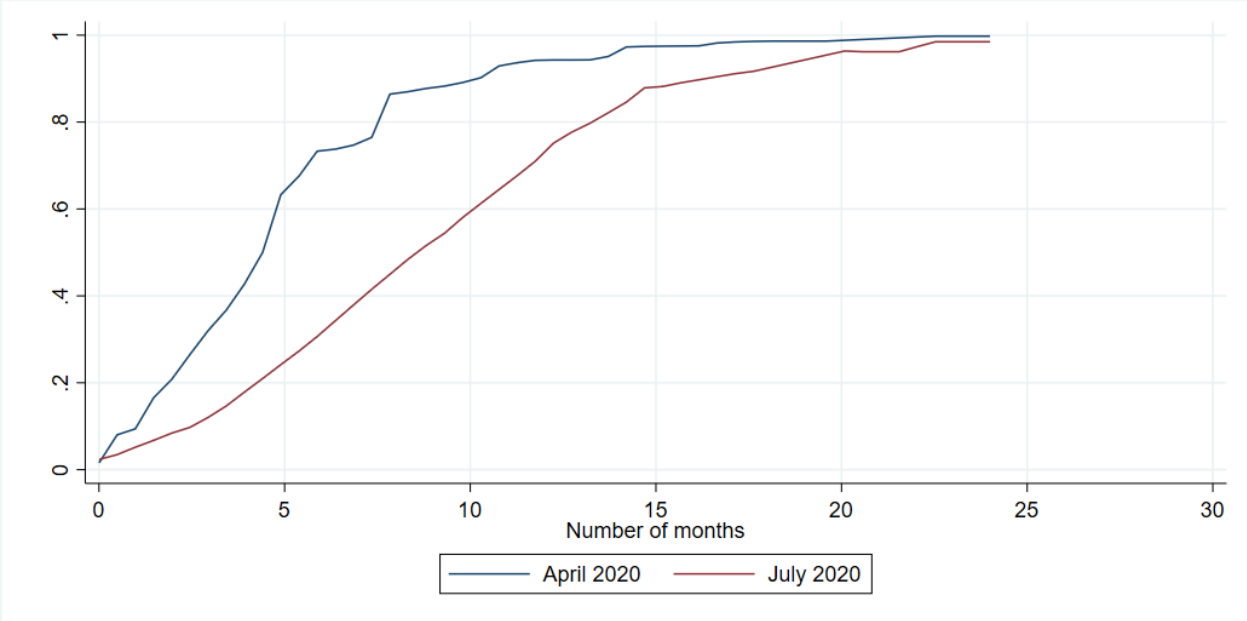
suggest that firms, on net, have viewed this crisis largely as a demand rather than a supply shock. Firms, responding to this demand shock, have lowered wages for a material share of their workforce, anticipate further wage cuts before the end of 2020, and anticipate lowering selling prices over the near-term.

Also, consistent with a demand shock, firms (like professional forecasters) lowered their 1-year ahead inflation expectations. Concurrently, inflation expectations of households have moved sharply higher, consistent with households' keying off salient prices or concerned with how vulnerable their nominal income is to the pandemic and their ability to manage in the face of sharp food price increases.

Our findings contribute to the rapidly emerging literature that examines direct effects of the pandemic on business ability to operate. Ramelli and Wagner (2020) show firms' stock prices were adversely affected when they were more dependent on international trade, global supply chains, and financial markets, with these effects becoming more pronounced by March. Alfaro et al. (2020) and Fahlenbrach et al. (2020) find similar results. Barrero et al. (2020) show that equity returns across U.S. listed firms fell sharply in March 2020, reaching levels similar to the Great Recession of 2008. Bartik et al. (2020) find similar operating and liquidity concerns for small businesses who have been especially affected by enforced lockdowns yet employ nearly fifty percent of American workers. Dingel and Neiman (2020) also show the effects may be heterogeneous as the proportion of jobs that can still be done under lockdown measures varies by industry.

From a monetary policy standpoint, perhaps the only point of solace here, is that longer-run inflation expectations of firms appear to be relatively well anchored. However, since mid-June, the path of the virus has accelerated and we have seen more and more hotspots emerging across the U.S. At the same time, the high-frequency data of Brave et al (2020), Chetty et al (2020), and other sources suggest economic activity has flattened out and begun, in some cases, to show signs of slowing. Here our findings are, perhaps, less comforting to policymakers. In April 2020 and again in July 2020, we asked firms to predict when the coronavirus would be behind them and they could get back to normal operations. Back in April, firms gave us responses that aligned well with Bartik et al (2020). At the time, half of the panel expected normal operations would resume by August

Figure 11: Cumulative share of the expected number of months until operations return to normal



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, April and July 2020.
Notes: The responses are smoothed using a 1st degree polynomial smoother and are truncated at the 99th percentile. The specific question is given in Appendix A Figure 25.

2020, and the most pessimistic firms (90th percentile) saw the coronavirus lasting until March 2021. However, firms have grown much more pessimistic since then. We repeated this question in July, and as Figure 11 indicates, the typical firm in July expects the pandemic to continue to disrupt normal business operations until April 2021. And, about 10 percent of the firms see the crisis lasting until the beginning of 2022. Moreover, as shown in Figure 12, firms that anticipate a longer duration of disruption from the coronavirus are also those that have indicated cutting a greater fraction of their employees' wages. These findings suggest that firms' expectations for the path of the virus could already be influencing their beliefs about the current and expected state of the labor market and, importantly, about future demand.

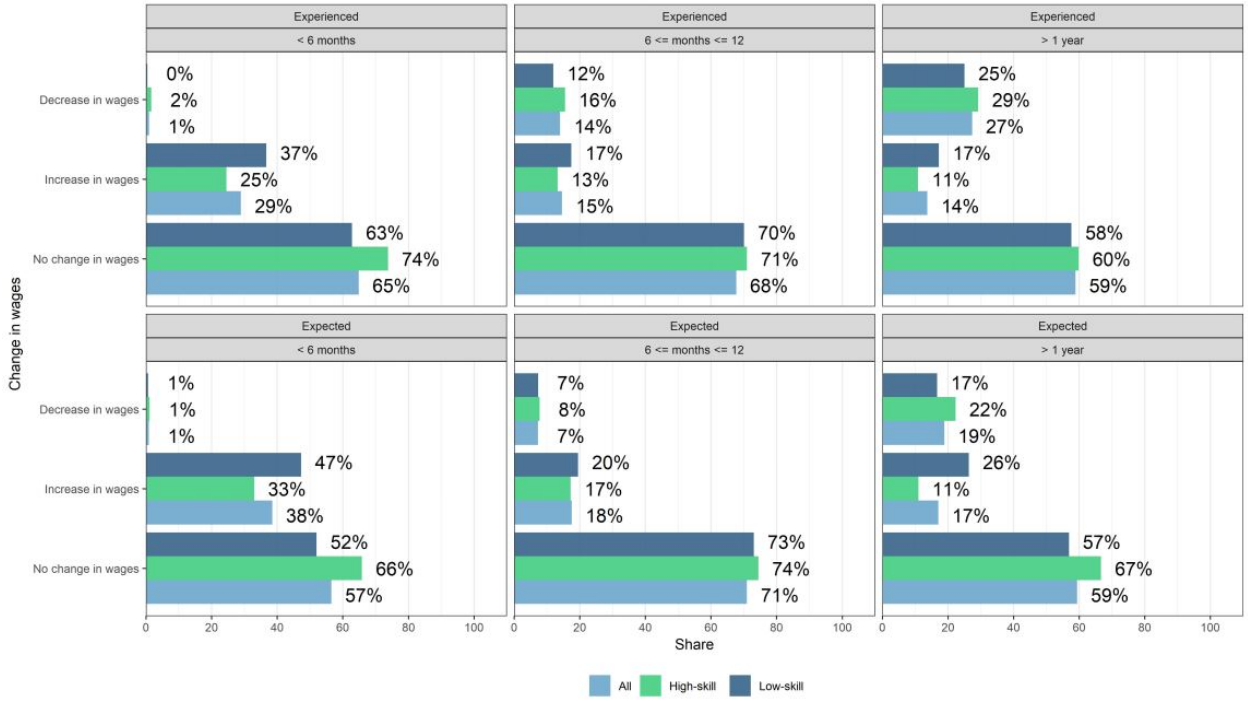
Should the COVID-19 linger over the U.S. for another 18 months or longer, bringing with it lower demand, further shutdowns, and negative sales gaps, it could lead to lasting scars (see Portes (2020)). Firms may respond by lowering wages further, lowering inflation expectations further or, perhaps, unanchoring longer-run expectations to the downside. The future is unfold-

Table 4: Expected number of months until business operations return to normal

	Mean	Median	P10	P25	P75	P90
April 2020	5.1	4.0	2.0	3.0	6.0	10.0
July 2020	9.3	9.0	3.0	6.0	12.0	18.0

Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, April and July, 2020.
Notes: Notes: There were 220 observations in April 2020 and 198 in July 2020. The specific question is given in Appendix A Figure 25.

Figure 12: Firms' Experienced and expected wage changed by expected duration of the pandemic



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, July and August 2020.
Notes: The low-skill expected and experienced values are based on 135 responses, 148 and 149 responses to the high-skill questions, and 300 for the all category. The specific questions asked are given in Appendix A Figures 25, 26, 27, 28 and 29.

ing swiftly and in highly uncertain ways. What the economy looks like on the other side of the COVID-19 pandemic, only time will tell.

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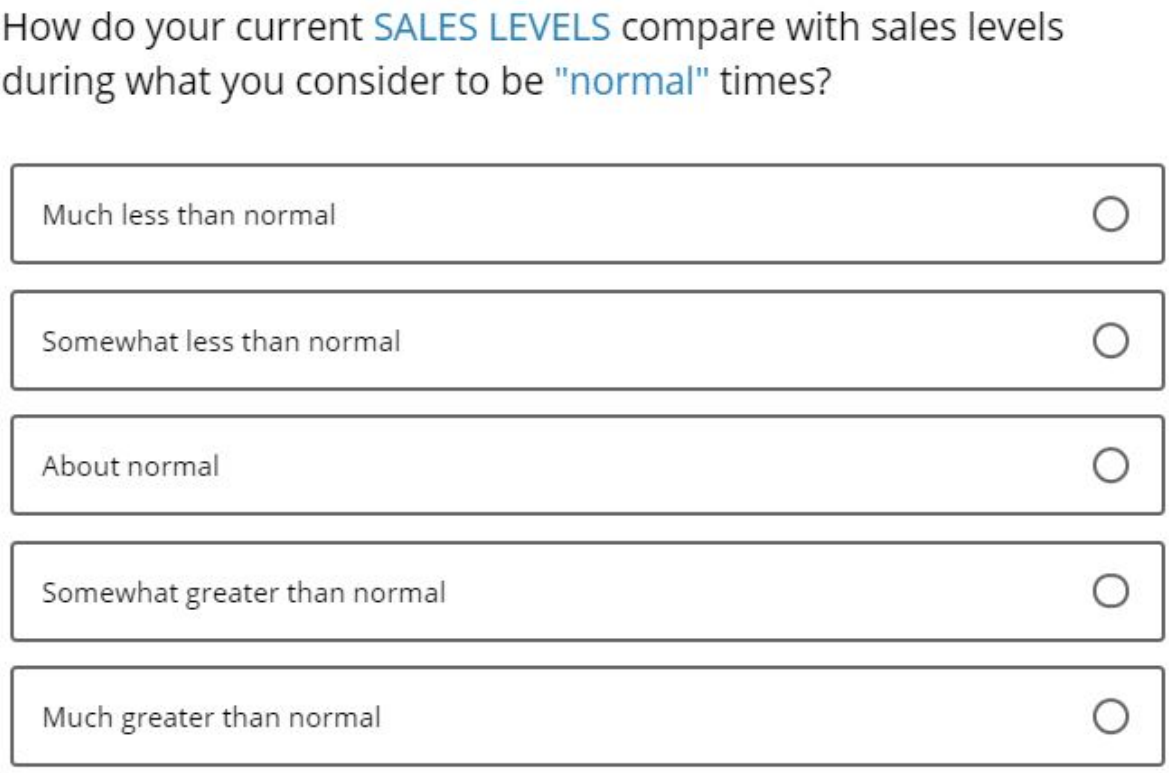
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Appendix A Business inflation expectations survey questions

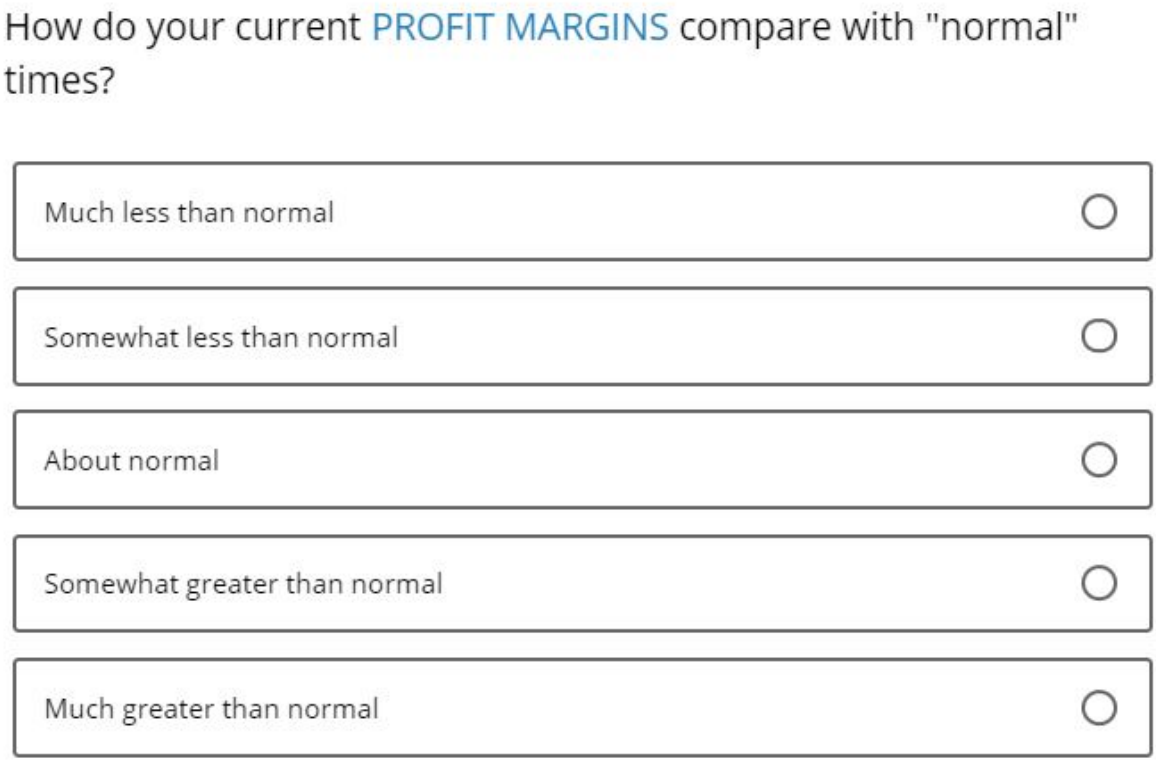
A.1 BIE core monthly questions

Figure 13



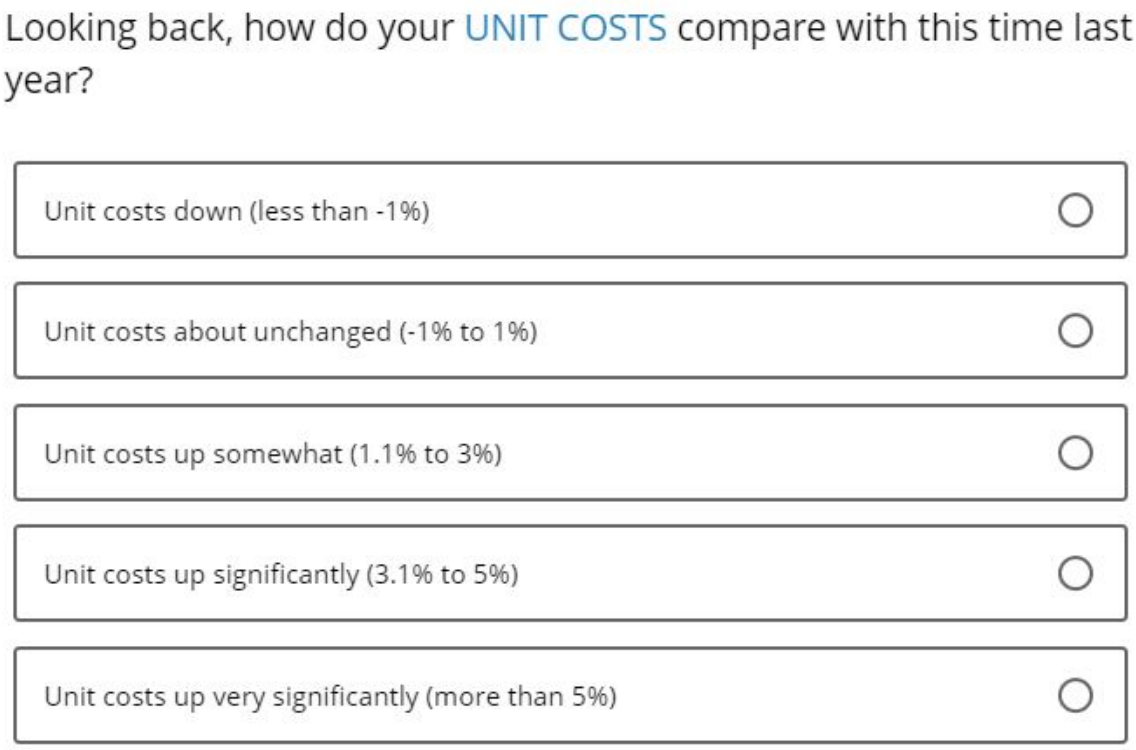
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*

Figure 14



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*

Figure 15



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*

Figure 16

Projecting ahead, to the best of your ability, please assign a percent likelihood to the following changes to UNIT COSTS over the next twelve months. (Values should sum to 100%)

For example, if you think each of these is equally likely, you might answer 20% for each:

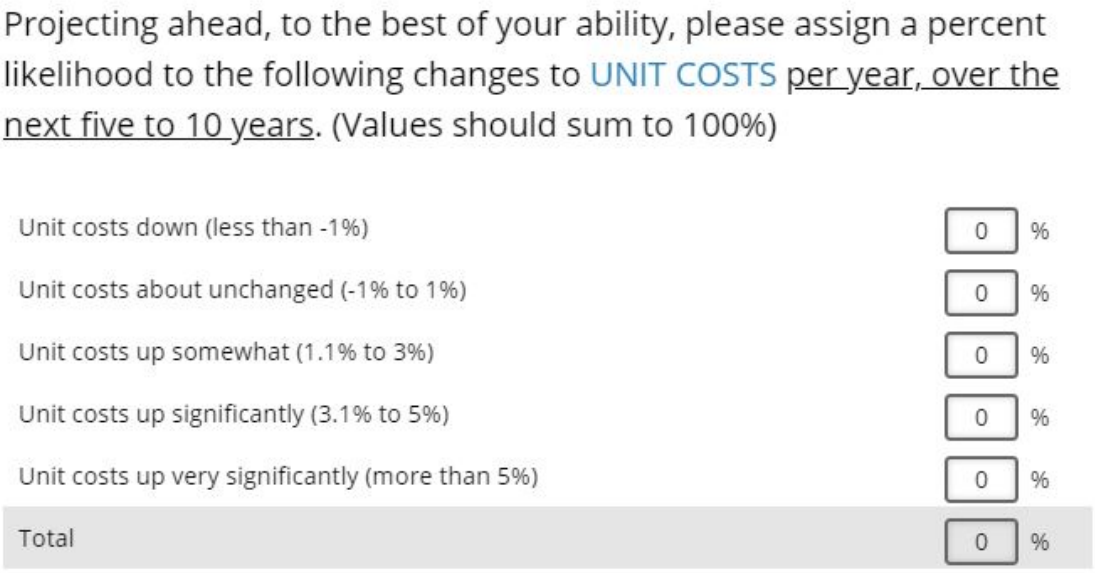
Unit costs down (less than -1%)	20
Unit costs about unchanged (-1% to 1%)	20
Unit costs up somewhat (1.1% to 3%)	20
Unit costs up significantly (3.1% to 5%)	20
Unit costs up very significantly (more than 5%)	20
Total	100

Unit costs down (less than -1%)	0	%
Unit costs about unchanged (-1% to 1%)	0	%
Unit costs up somewhat (1.1% to 3%)	0	%
Unit costs up significantly (3.1% to 5%)	0	%
Unit costs up very significantly (more than 5%)	0	%
Total	0	%

Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*

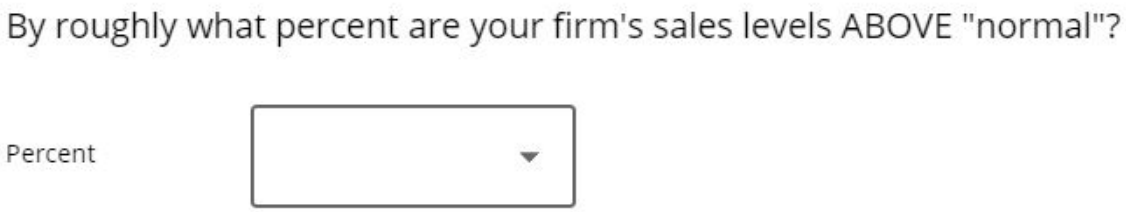
A.2 BIE core quarterly questions

Figure 17



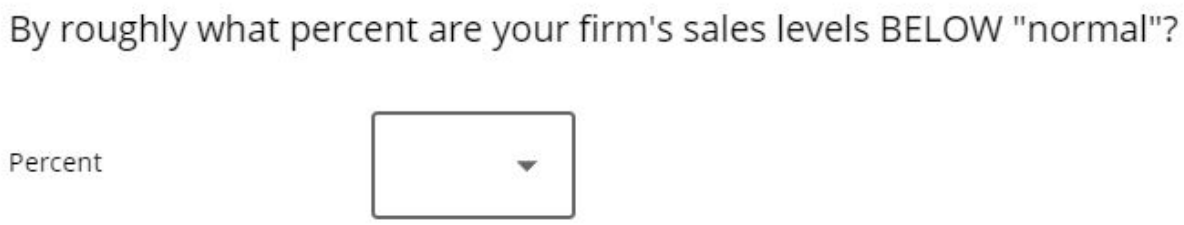
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*

Figure 18



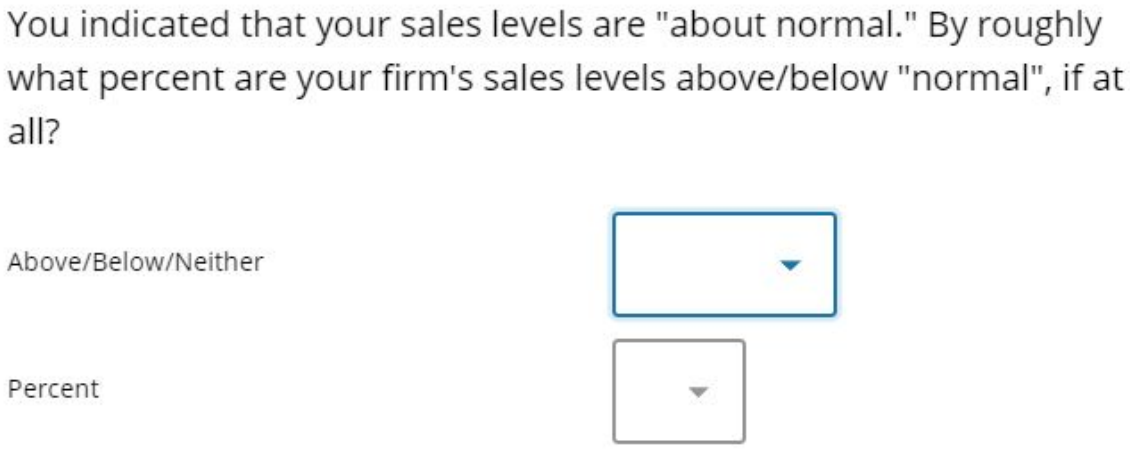
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*

Figure 19



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*

Figure 20



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*

A.3 BIE special questions

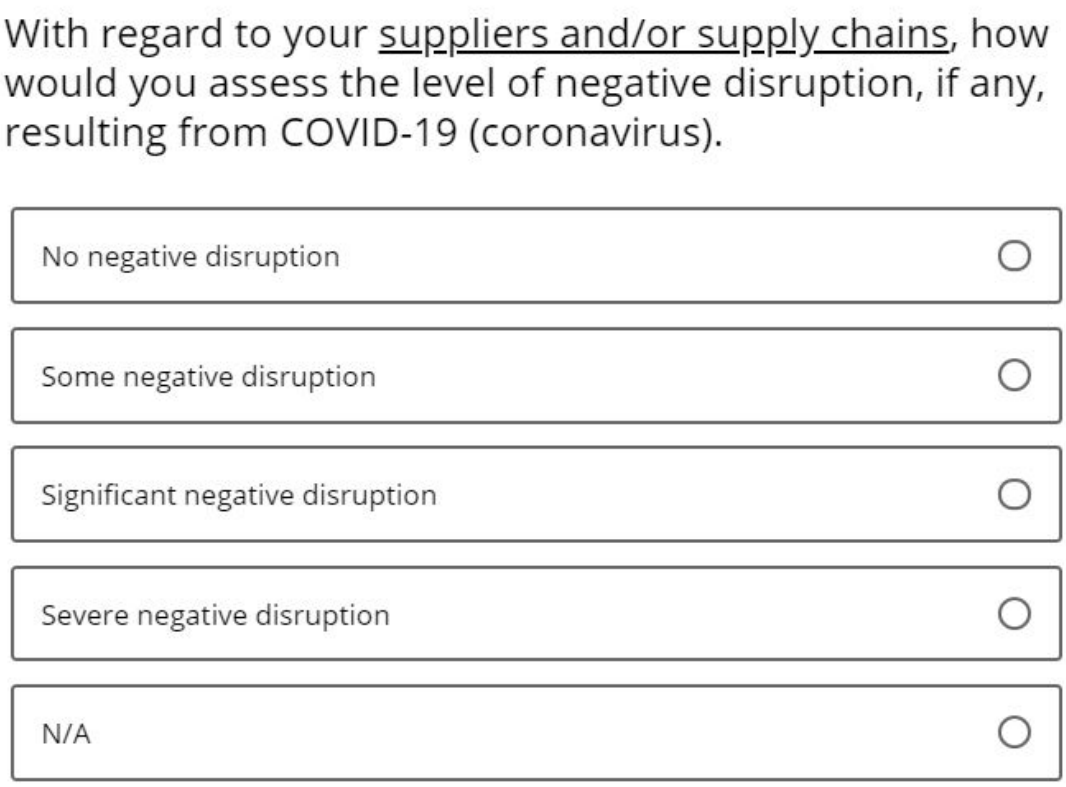
Figure 21

On a scale from 1 to 5, with 1 being "no disruption," how would you assess the level of disruption resulting from the recent outbreak of coronavirus when it comes to the items listed below?

	1 - No disruption	2	3 - Moderate disruption	4	5 - Severe disruption	Too soon to tell
business operations	○	○	○	○	○	○
sales activity	○	○	○	○	○	○

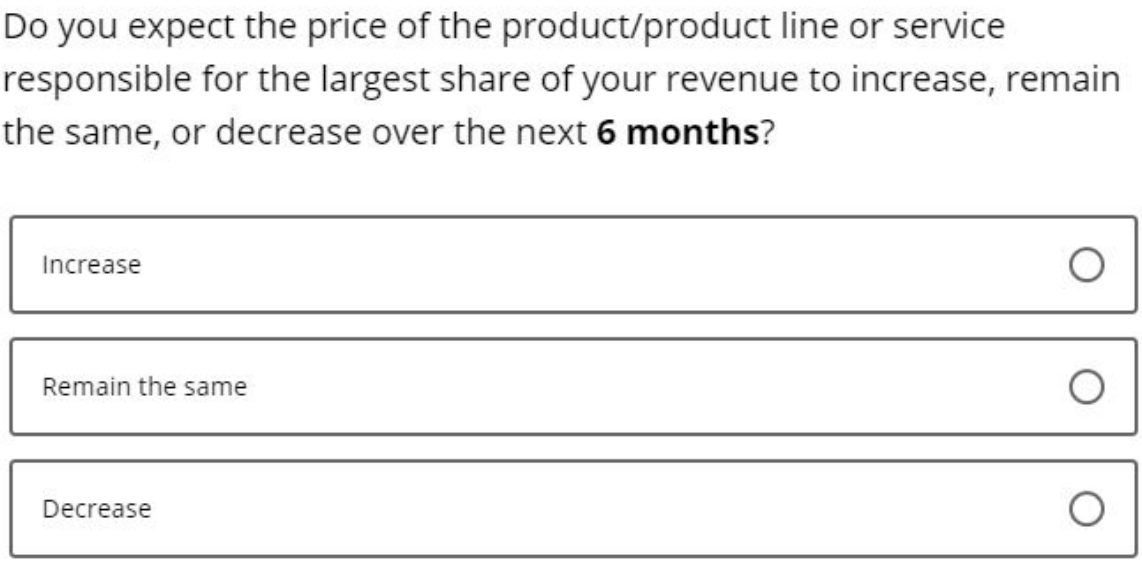
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, April and July 2020

Figure 22



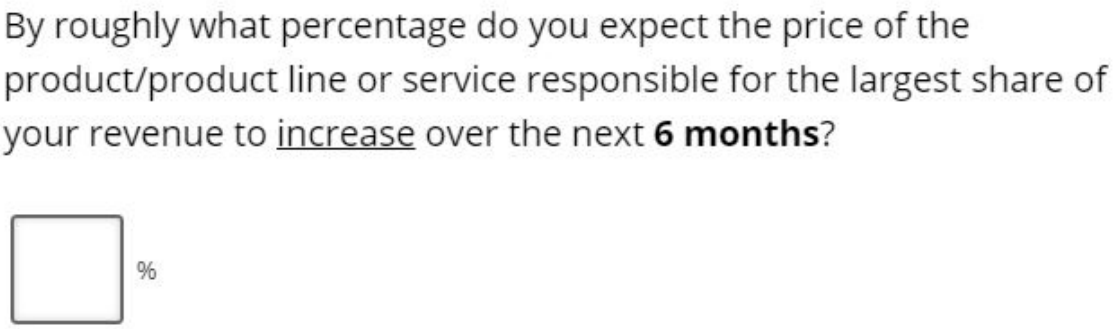
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, May 2020

Figure 23



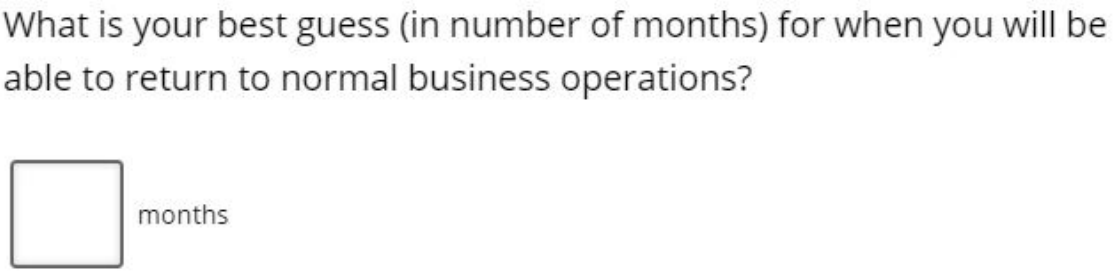
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, April 2020

Figure 24



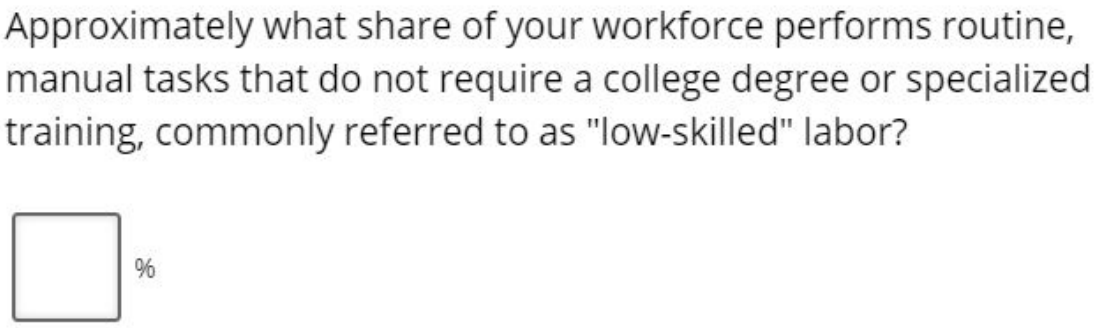
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, April 2020

Figure 25



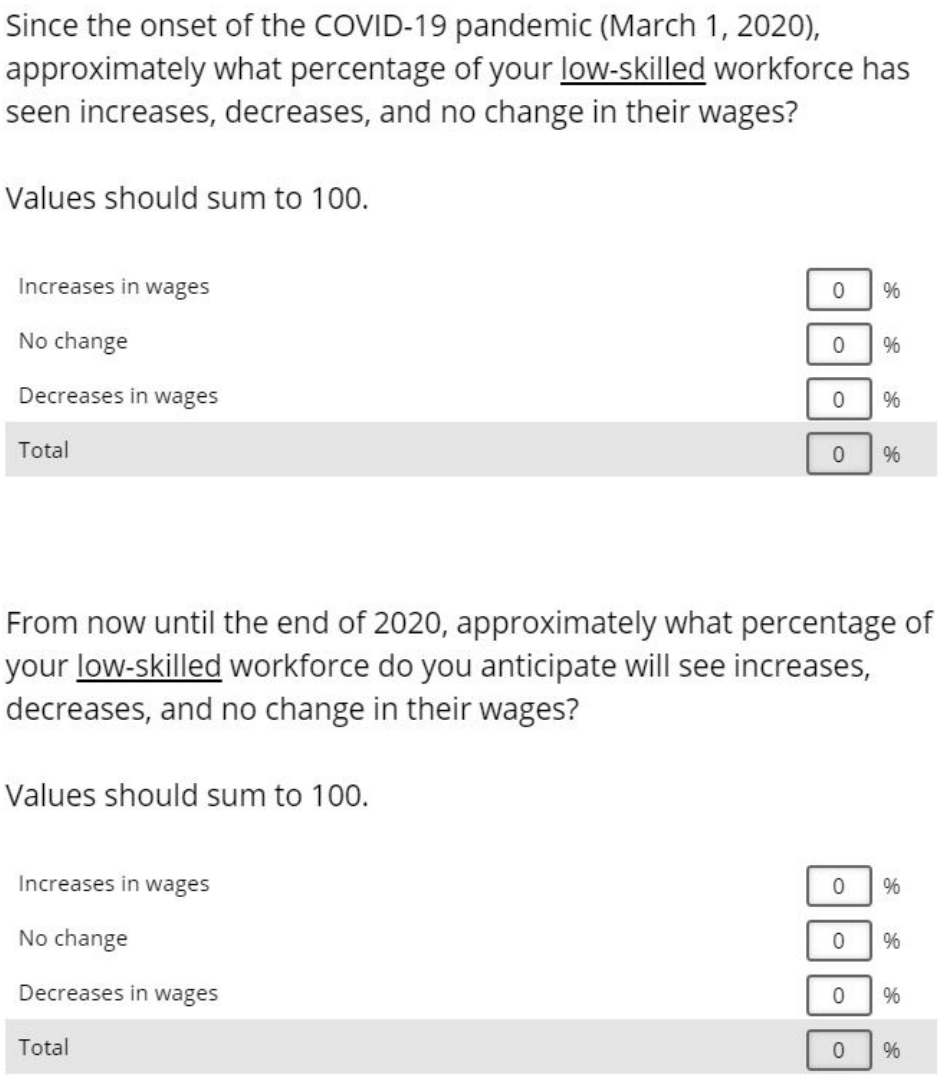
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, April and July 2020

Figure 26



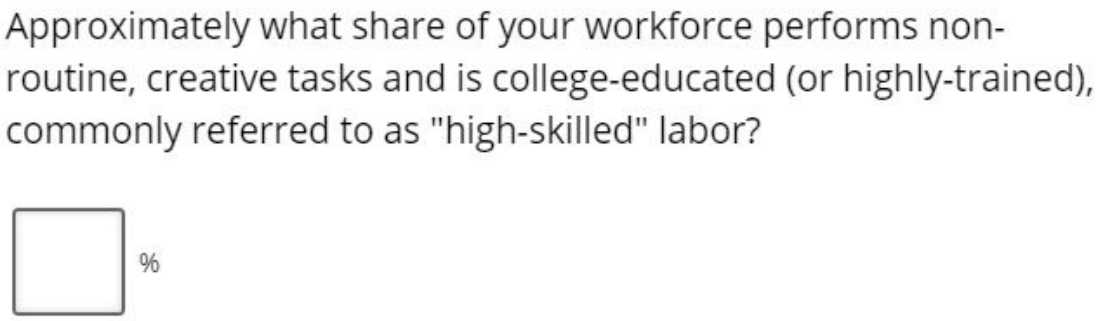
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, August 2020

Figure 27



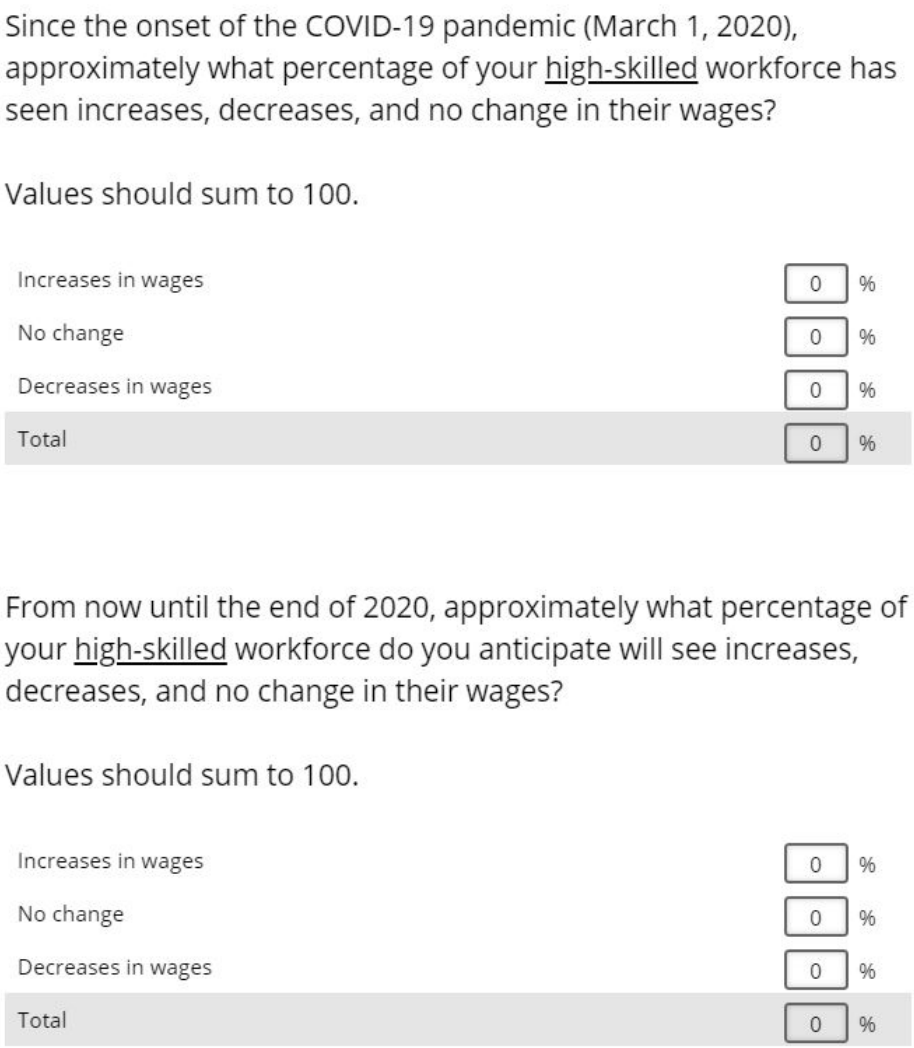
Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, August 2020

Figure 28



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, August 2020

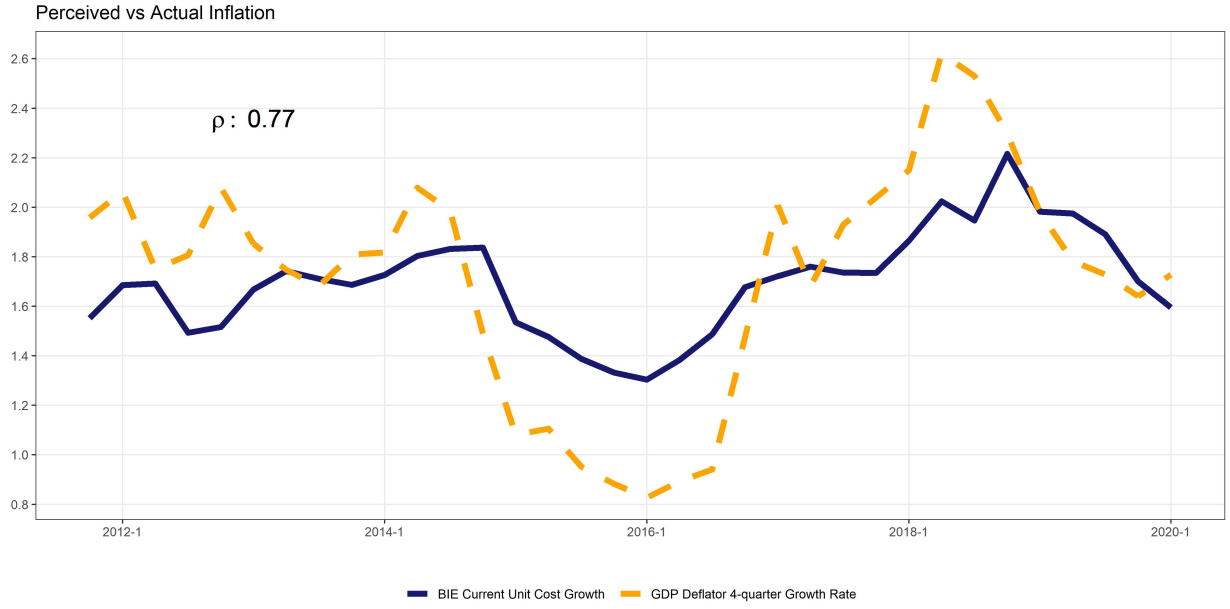
Figure 29



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, August 2020

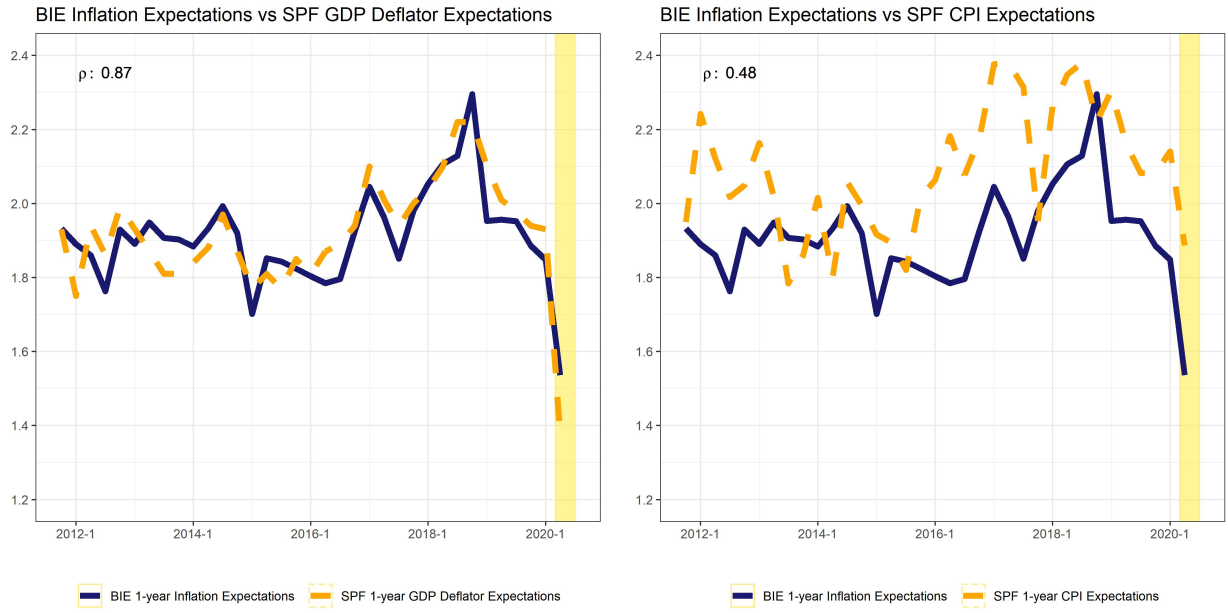
Appendix B Time-series comparison of BIE inflation with SPF inflation expectations and realized inflation

Figure 30: Firms' perceived inflation and realized inflation



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*
Note: The correlation between the time-series is given by ρ.

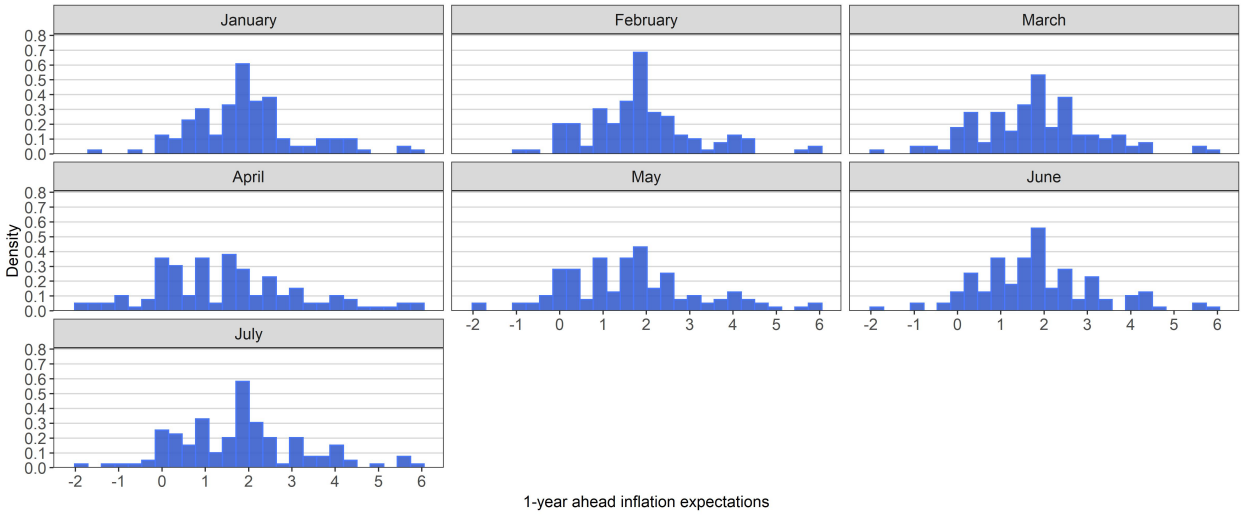
Figure 31: Expected inflation of firms and professional forecasters



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*
Note: The correlation between the time-series is given by ρ.

Appendix C Monthly distribution of firm inflation expectations

Figure 32: Distribution of short run inflation expectations



Source: Federal Reserve Bank of Atlanta's *Business Inflation Expectations Survey*, January–July 2020

Appendix D Household "inflation" expectations and the underlying CPI price change distribution

Figure 33: Household's expected impact of COVID-19 on inflation - questions

Over the next 12 months, do you think that the coronavirus will cause inflation to be higher or lower? Higher/Lower

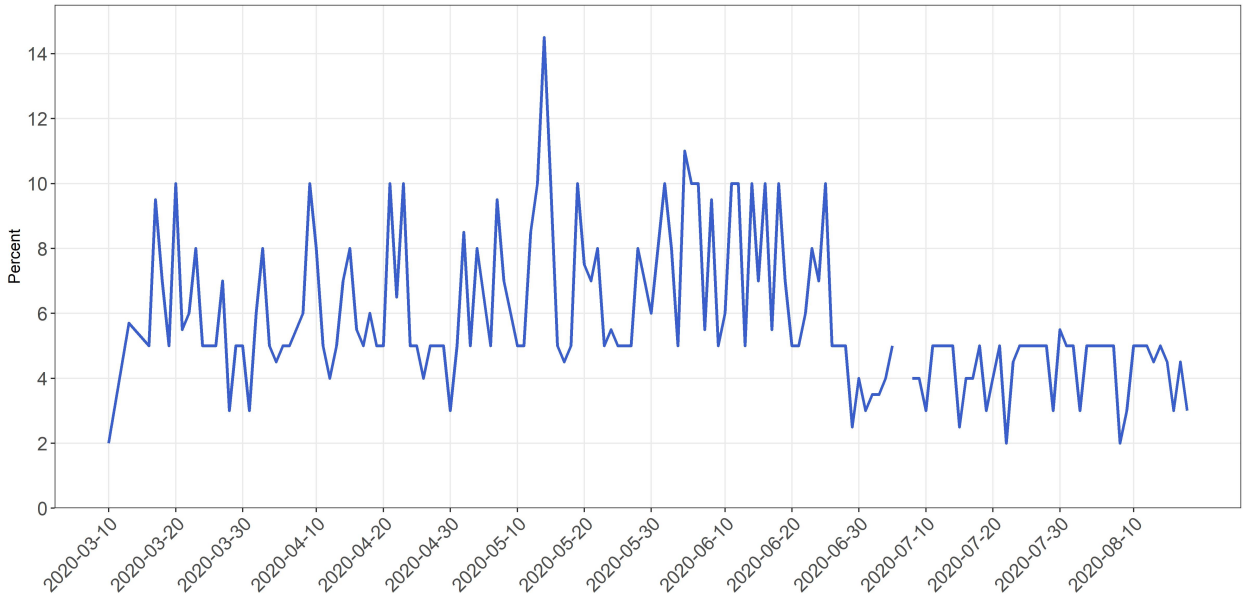
Depending on the answer (Higher/Lower), we ask respondents to fill in their point estimates according to:

How much [higher/lower] do you expect the rate of to be over the next 12 months because of coronavirus? Please give your best guess.

I expect the rate of inflation to be _____ percentage points [higher/lower] because of coronavirus.

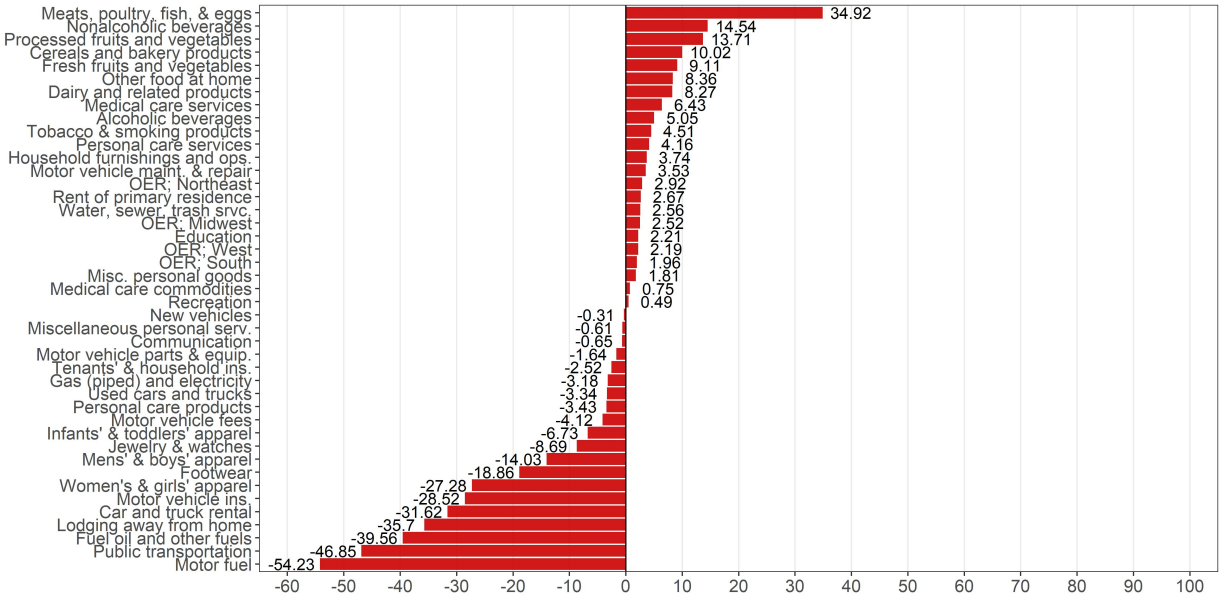
Source: Federal Reserve Bank of Cleveland's *Consumers and COVID-19*

Figure 34: Household's expected impact of COVID-19 on inflation - results



Source: Federal Reserve Bank of Cleveland's *Consumers and COVID-19*

Figure 35: CPI component price change distribution



Source: Consumer price index, author's calculations.